

Application Serial No.: 10/825,800
Applicant(s): Leonhardt et al.

Docket No.: N.C. 95,876

REMARKS

Claims 1-36 are pending in this application. Claims 1-36 have been rejected.

Claims 1, 19 are currently amended.

Rejection under 35 U.S.C. 112, second paragraph

The Examiner has rejected Claims 1-36 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter.

The Examiner states that Claim 1 lacks antecedent basis for the limitation of "the plasma sheet". Claim 1 has been amended to recite "a plasma sheet".

The Examiner states that Claim 1 lacks antecedent basis for the limitation of "the radical and ion flux". Claim 1 has been amended to recite "a radical and ion flux".

The Examiner states that Claims 2-18 depend from Claim 1 and are therefore rejected too. However, as stated above, Claim 1 has been amended and as such this rejection is obviated.

The Examiner states that Claim 19 lacks antecedent basis for the limitation of "the radical and ion flux". Claim 19 has been amended to recite "a radical and ion flux".

The Examiner states that Claims 20-36 depend from Claim 19 and are therefore rejected too. However, as stated above, Claim 19 has been amended and as such this rejection is obviated.

In summary, Applicants respectfully submit that Claims 1 and 19 have been amended, and since Claims 2-18 and Claims 20-36 are dependent on Claims 1 and 19, the rejection under 35 U.S.C. 112 has been obviated as to all claims 1-36. Therefore, Applicants respectfully request reconsideration.

Application Serial No.: 10/825,800
Applicant(s): Leonhardt et al.

Docket No.: N.C. 95,876

Rejection under 35 USC 102(b)

The Examiner has rejected Claims 1-7 and 19-25 under 35 U.S.C. 102(b) as being anticipated by "Theoretical overview of the large-area plasma processing system (LAPPS)" by Manheimer et al. (Manheimer).

The Examiner states that Manheimer discloses a LAPPS system comprising a sheet electron beam, gas for a plasma, formed plasma, and substrate. The Examiner states that the surface of the substrate is altered by the radical and ion flux and are controlled based upon the desired pretreatment.

Applicants respectfully submit the following traversal of this rejection. Manheimer is a theoretical discussion of a basic LAPPS system in general. Manheimer does not teach or suggest the current large area metallization pretreatment and surface activation system. Manheimer does not teach or suggest the current method of producing a chemically active surface to improve the ability of a film to adhere to a substrate.

Applicants respectfully submit that the title of Manheimer is explicit and definitive in this regard as the discussion is entitled "*Theoretical* overview of the large-area plasma processing system (LAPPS)" (emphasis added). The discussion outlines the scientific and mathematical explanations for a LAPPS system, but does not teach or suggest the current large area metallization pretreatment and surface activation system nor does Manheimer teach or suggest the current method of producing a chemically active surface to improve the ability of a film to adhere to a substrate. Applicants respectfully submit that mathematical formulas, laws of nature, and purely theoretical phenomena have long been considered unpatentable.

Application Serial No.: 10/825,800
Applicant(s): Leonhardt et al.

Docket No.: N.C. 95,876

Furthermore, Applicants respectfully submit that the current large area metallization pretreatment and surface activation system removes the critical limitations set forth in and required by the Manheimer theoretical discussion. Manheimer specifically states that there in fact exist size limitations for the plasma and electron beam. Additionally, Manheimer repeatedly, and throughout the theoretical discussion, states the requirement of a magnetic field. The current invention does not require a magnetic field, although in some embodiments a magnetic field may be utilized.

In Manheimer, there are multiple references throughout to the requirement of a magnetic field. Some of these references include, but are not limited to, the Abstract (line 5), the Introduction (line 15 of the first column and line 18 of the second column and multiple references in the final paragraph of the Abstract). The first sentence of the second section (2. Beam propagation and plasma production) reads, in part, "*discuss* the production and maintenance of a plasma by a *magnetized* electron beam". (emphasis added) More references include the first full paragraph of page 372 as published "a longitudinal magnetic field *B* is applied" and the next paragraph includes "the magnetic field can be tapered." As mentioned, these references are listed throughout and include a specific reference in the Summary section when the authors state there is a "need for a magnetic field".

The present application specifically mentions that a magnetic field is not required. For example, on page 13 or paragraph 0022 as filed, the application states that the electron beam can be produced "without the beam-collimating magnetic field". Additionally, Figure 4 illustrates a schematic without a magnetic field.

As such, Applicants respectfully submit that the current invention was not discussed in any printed publication.

Application Serial No.: 10/825,800
Applicant(s): Leonhardt et al.

Docket No.: N.C. 95,876

Therefore, Applicants respectfully submit that the 102(b) rejection has been successfully traversed and that claims 1 and 19 are in condition for allowance. As claims 2-7 and 20-25 depend from an allowable claim, Applicants respectfully submit that these claims are also in condition for allowance. Applicants respectfully request reconsideration as to, and removal of, the 102(b) rejection.

Rejection under 35 USC 103

The Examiner has rejected Claims 8-14, 16-18, 26-32, and 34-36 under 35 U.S.C. 103(a) as being unpatentable over "Theoretical overview of the large-area plasma processing system (LAPPS)" by Manheimer et al. (Manheimer) in view of US 5,089,066 to Hamada et al. (Hamada).

The Examiner states that Manheimer indicates that a pretreatment is to be used before conventional plasma processing but does not disclose depositing a layer onto the pretreated substrate. The Examiner also states that Hamada discloses various deposition techniques that can be used after a substrate is pretreated. The Examiner concludes that it would have been obvious to "modify the *invention* of Manheimer" to utilize sputtering of CVD. (emphasis added)

Applicants respectfully submit that Manheimer does not teach an invention. Rather, Manheimer is a theoretical discussion as is evidenced by the title of the article as well as the language of the discussion as used throughout Manheimer.

As previously stated, Manheimer is a theoretical discussion of a basic LAPPS system in general. Manheimer does not teach or suggest the current large area metallization pretreatment

Application Serial No.: 10/825,800
Applicant(s): Leonhardt et al.

Docket No.: N.C. 95,876

and surface activation system. Manheimer does not teach or suggest the current method of producing a chemically active surface to improve the ability of a film to adhere to a substrate.

Applicants respectfully submit that the title of Manheimer is explicit and definitive in this regard as the discussion is entitled "*Theoretical* overview of the large-area plasma processing system (LAPPS)" (emphasis added). The discussion outlines the scientific and mathematical explanations for a LAPPS system, but does not teach or suggest the current large area metallization pretreatment and surface activation system nor does Manheimer teach or suggest the current method of producing a chemically active surface to improve the ability of a film to adhere to a substrate. Applicants respectfully submit that mathematical formulas, laws of nature, and purely theoretical phenomena have long been considered unpatentable.

Furthermore, Applicants respectfully submit that the current large area metallization pretreatment and surface activation system removes the critical limitations set forth in and required by the Manheimer theoretical discussion. Manheimer specifically states that there in fact exist size limitations for the plasma and electron beam. Additionally, Manheimer repeatedly, and throughout the theoretical discussion, states the requirement of a magnetic field. The current invention does not require a magnetic field, although in some embodiments a magnetic field may be utilized.

In Manheimer, there are multiple references throughout to the requirement of a magnetic field. Some of these references include, but are not limited to, the Abstract (line 5), the Introduction (line 15 of the first column and line 18 of the second column and multiple references in the final paragraph of the Abstract). The first sentence of the second section (2. Beam propagation and plasma production) reads, in part, "*discuss* the production and maintenance of a plasma by a *magnetized* electron beam". (emphasis added) More references

Application Serial No.: 10/825,800
Applicant(s): Leonhardt et al.

Docket No.: N.C. 95,876

include the first full paragraph of page 372 as published “a longitudinal magnetic field B is applied” and the next paragraph includes “the magnetic field can be tapered.” As mentioned, these references are listed throughout and include a specific reference in the Summary section when the authors state there is a “need for a magnetic field”.

The present application specifically mentions that a magnetic field is not required. For example, on page 13 or paragraph 0022 as filed, the application states that the electron beam can be produced “without the beam-collimating magnetic field”. Additionally, Figure 4 illustrates a schematic without a magnetic field.

Furthermore, Applicants respectfully submit that since claim 8 depends from the allowable claim 1, that claim 8 is therefore in condition for allowance and the rejection under 35 U.S.C. 103 is obviated. Similarly, claims 9-13 depend from claim 8 and since claim 8 depends from claim 1 and since claim 8 and claim 1 are in condition for allowance, Applicants respectfully submit that claims 9-13 are also in condition for allowance.

Similarly, claim 14 depends from claim 1, an allowable claim, and since claims 16-18 depend from claim 14, Applicants respectfully submit that claims 14 and 16-18 are in condition for allowance.

Again similarly, claim 26 depends from claim 19, an allowable claim, and since claims 27-31 depend from claim 19, Applicants respectfully submit that claims 26 and 27-31 are in condition for allowance.

Likewise, claim 32 depends from claim 19, an allowable claim, and since claims 34-36 depend from claim 19, Applicants respectfully submit that claims 32 and 34-36 are in condition for allowance.

Application Serial No.: 10/825,800
Applicant(s): Leonhardt et al.

Docket No.: N.C. 95,876

Applicants respectfully request reconsideration as to, and removal of, the rejection of claims 8-14, 16-18, 26-32 and 34-36.

The Examiner has rejected Claims 15 and 33 under 35 U.S.C. 103(a) as being unpatentable over “Theoretical overview of the large-area plasma processing system (LAPPS)” by Manheimer et al. (Manheimer) in view of US 5,089,066 to Hamada et al. (Hamada) as applied to claims 14 and 32 above, and further in view of US 5,178,739 to Barnes et al. (Barnes).

The Examiner states that it would have been obvious to “modify the *invention* of Manheimer” in view of Hamada to utilize magnetrons. (emphasis added)

Again, Applicants respectfully submit that Manheimer does not teach an invention. Rather, Manheimer is a theoretical discussion as is evidenced by the title of the article as well as the language of the discussion as used throughout Manheimer.

As previously stated, Manheimer is a theoretical discussion of a basic LAPPS system in general. Manheimer does not teach or suggest the current large area metallization pretreatment and surface activation system. Manheimer does not teach or suggest the current method of producing a chemically active surface to improve the ability of a film to adhere to a substrate.

Applicants respectfully submit that the title of Manheimer is explicit and definitive in this regard as the discussion is entitled “*Theoretical* overview of the large-area plasma processing system (LAPPS)” (emphasis added). The discussion outlines the scientific and mathematical explanations for a LAPPS system, but does not teach or suggest the current large area metallization pretreatment and surface activation system nor does Manheimer teach or suggest the current method of producing a chemically active surface to improve the ability of a film to

Application Serial No.: 10/825,800
Applicant(s): Leonhardt et al.

Docket No.: N.C. 95,876

adhere to a substrate. Applicants respectfully submit that mathematical formulas, laws of nature, and purely theoretical phenomena have long been considered unpatentable.

Furthermore, Applicants respectfully submit that the current large area metallization pretreatment and surface activation system removes the critical limitations set forth in and required by the Manheimer theoretical discussion. Manheimer specifically states that there in fact exist size limitations for the plasma and electron beam. Additionally, Manheimer repeatedly, and throughout the theoretical discussion, states the requirement of a magnetic field. The current invention does not require a magnetic field, although in some embodiments a magnetic field may be utilized.

In Manheimer, there are multiple references throughout to the requirement of a magnetic field. Some of these references include, but are not limited to, the Abstract (line 5), the Introduction (line 15 of the first column and line 18 of the second column and multiple references in the final paragraph of the Abstract). The first sentence of the second section (2. Beam propagation and plasma production) reads, in part, “*discuss* the production and maintenance of a plasma by a *magnetized* electron beam”. (emphasis added) More references include the first full paragraph of page 372 as published “a longitudinal magnetic field *B* is applied” and the next paragraph includes “the magnetic field can be tapered.” As mentioned, these references are listed throughout and include a specific reference in the Summary section when the authors state there is a “need for a magnetic field”.

The present application specifically mentions that a magnetic field is not required. For example, on page 13 or paragraph 0022 as filed, the application states that the electron beam can be produced “without the beam-collimating magnetic field”. Additionally, Figure 4 illustrates a schematic without a magnetic field.

Application Serial No.: 10/825,800
Applicant(s): Leonhardt et al.

Docket No.: N.C. 95,876

Furthermore, Applicants respectfully submit that since claim 15 depends from the allowable claim 14, that claim 15 is therefore in condition for allowance and the rejection under 35 U.S.C. 103 is obviated. Similarly, claim 33 depends from claim 32 and since claim 32 depends from claim 19 and since claim 19 is in condition for allowance, Applicants respectfully submit that claim 33 is also in condition for allowance and the rejection under 35 U.S.C. 103 is obviated.

Application Serial No.: 10/825,800
Applicant(s): Leonhardt et al.

Docket No.: N.C. 95,876


Conclusion

In conclusion, Applicants respectfully submit that the Examiner's Office Action has been fully responded to and that the claims are in condition for allowance. In the furtherance of compact prosecution, if a personal or telephone interview would help expedite matters, the Examiner is requested to contact Steve Hunnius at 202-404-1554.

Kindly charge any additional fees due, or credit overpayment of fees, to Deposit Account No. 50-0281.

Applicants respectfully request that a timely Notice of Allowance be issued in this case.

Respectfully submitted,



Stephen T. Hunnius
Reg. No. 48,304
Naval Research Laboratory
Code 1008.2
4555 Overlook Avenue, S.W.
Washington, D.C. 20375-5325
(202) 404-1554